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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,568	11/14/2003	Kenneth R. Newman	CTES 016	8261
7590	12/28/2004		EXAMINER	
Guy McClung PMB 347 16690 Champion Forest Drive Spring, TX 77379-7023			MARTIR, LILYBETT	
			ART UNIT	PAPER NUMBER
			2855	

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/713,568	NEWMAN, KENNETH R.	
	Examiner	Art Unit	
	Lilybett Martir	2855	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
 THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on \_\_\_\_\_.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-29 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_ is/are allowed.  
 6) Claim(s) 1-13, 16-19 and 21-27 is/are rejected.  
 7) Claim(s) 14, 15, 20, 28 and 29 is/are objected to.  
 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date 3/4/04.
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1,3,6,18,21,23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill III et al. (Pat. 5,193,628) in view of Dublin Jr. (Pat. 6,068,394).

With respect to claims 1 and 23, Hill III et al. teaches a plurality of strain gauges 29 emplaceable on the structure 19, signal transmission apparatus as in elements 22,33,24 and 34 associated with the plurality of strain gauges for transmitting signals therefrom indicative of measurements by the plurality of strain gauges to computer apparatus for processing signals from the strain gauges as noted in Figure 3, the plurality of strain gauges 29 including at least three strain gauge apparatuses for providing axial strain measurements at each location of one of the at least three strain gauge apparatuses (Col. 3, lines 30-30-33), and computer apparatus 37 for receiving signals from the transmitting apparatus indicative of the measurements of the at least three strain gauge apparatuses 29. Hill III et al. fails to specifically teach said computer being utilized for determining bending moment of the structure at a location of a plane including the at least three strain gauge

apparatuses. Dublin Jr. teaches a drilling data apparatus that teaches that the determination of the bending moments is known and expected (Col. 1, lines 52-60). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the path determining apparatus of Hill III et al. utilizing the teachings of the drilling data apparatus of Dublin Jr. by utilizing it's computer means to determine from the strain gauges the bending moments on the structure being monitored to improve said apparatus and make it more efficient (Col. 1, lines 52-60).

- With respect to claims 3 and 25, Hill III et al. teaches the computer apparatus 39 is programmed to calculate bending direction of the structure at said location based on said measurements (Col. 6, lines 8-23).
- With respect to claims 6 and 21, Hill III et al. teaches an encasement material encasing the plurality of strain gauges (Col. 6, lines 3-7).
- With respect to claim 10, Hill III et al. teaches a display apparatus as in element 39 for displaying to an operator, determinations of the computer apparatus.
- With respect to claim 18, Hill III. Et al. teaches that his apparatus is to be utilized in a pipe in the drilling art, which may easily be from the group consisting of riser, subsea riser, lubricator, pipe support structure, tubular string, and lubricator stack (Col. 2, lines 43-54).

3. Claims 2,9 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill III et al. in view of Dublin Jr., and further in view of Gysling et al. (Pat. 6,354,147).

- With respect to claims 2 and 24, Hill III et al. in view of Dublin Jr. fails to teach his computer apparatus programmed to calculate internal pressure of the structure based on strain measurements from the plurality of strain gauges. Gysling et al. teaches that it is well known that the information obtained from strain gauges is utilized to determine pressure measurements (Col. 16, lines 5-29). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the path determining apparatus of Hill III et al. utilizing the teachings of the drilling data apparatus of Dublin Jr. and further utilizing the teachings of the fluid parameter measuring device of Gysling et al. by utilizing the information obtained from the strain gauges to determine the internal pressure on the structure to monitor pressure variations in said structure in an efficient and reliable manner (Col. 16, lines 6-10).
- With respect to claim 9, Hill III et al. fails to teach that each of the plurality of strain gauges comprises a fiber optic strain gauge. Gysling et al. teaches that the utilization of equivalent optical strain gauges is common and known in the art (Col. 15, lines 60-63). It would have been obvious at the time the invention was made to a person having ordinary

skill in the art to modify the teachings of the path determining apparatus of Hill III et al. utilizing the teachings of the drilling data apparatus of Dublin Jr. and further utilizing the teachings of the fluid parameter measuring device of Gysling et al. by utilizing equivalent optical strain gauges to facilitate measuring the structure's strain in a reliable and well known manner.

4. Claims 4-5 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill III et al. in view of Dublin Jr. and further in view of Das (Pat. 4,739,841).

With respect to claims 4-5 and 26-27, Hill III et al. teaches making continuous measurements (Col. 6-7, lines 59-14). Hill III et al. fails to teach the computer apparatus determining bending moment specifically in real time, even though he does not mention any delay between his data acquisition time and the calculations he makes. Das teaches that it is well known to make measurements in a real-time manner. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the path determining apparatus of Hill III et al. utilizing the teachings of the drilling data apparatus of Dublin Jr. and further utilizing the teachings of the controlling apparatus of Das by making the measurement calculations in a real-time manner to facilitate the continual monitoring of the forces being measured (Col. 2, lines 23-29).

5. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill III et al. in view of Dublin Jr. and further in view of Hatch et al. (Pat. 5,526,208).

- With respect to claims 7-8, Hill III et al. fails to teach that his encasement material comprises insulating material for enhancing uniformity of operation of the plurality of strain gauges during temperature changes, said encasing material comprising potting material. Hatch et al. teaches his strain gauge 408 having insulating layers 410 and 406, said encasing material comprising potting material (Col. 4, lines 4-5). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the path determining apparatus of Hill III et al. utilizing the teachings of the drilling data apparatus of Dublin Jr. and further utilizing the teachings of the sensor of Hatch et al. by providing it with a covering of insulating potting material to further protect the apparatus from environmental hazards that may affect it's functioning.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hill III et al. in view of Dublin Jr. and further in view of Sanchez (Pat. 3,638,211)

- With respect to claim 11, Hill III et al fails to teach an alarm apparatus for warning an operator of the system that a maximum allowable stress on the structure has been reached, the computer apparatus programmed to calculate maximum allowable stress and in communication with the alarm apparatus. Sanchez teaches that the utilization of an alarm system

to alert that a predetermined amount of stress has been reached (Col. 3, lines 24-28). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the path determining apparatus of Hill III et al. utilizing the teachings of the drilling data apparatus of Dublin Jr. and further utilizing the teachings of the safety system of Sanchez by providing warning an operator of the system that a maximum allowable stress on the structure has been reached to further improve the safety of the apparatus by notifying the user if an unusual circumstance makes it prone to breaking or damage.

7. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill III et al. in view of Dublin Jr. and further in view of Farhadiroushan et al. (Pat. 6,380,534).

With respect to claims 12-13, Hill III et al. fails to teach a temperature measurement apparatus for measuring temperature of the structure at the location of plurality of strain gauges, the temperature measurement apparatus comprising fiber optic strain gauge apparatus for measuring temperature. Farhadiroushan et al. teaches utilizing a temperature measurement apparatus comprising fiber optic strain gauge (See abstract). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the path determining apparatus of Hill III et al. utilizing the teachings of the drilling data apparatus of Dublin Jr. and further utilizing the teachings of

the strain and temperature sensing system of Farhadiroushan et al. by providing in it a temperature measurement apparatus comprising fiber optic strain gauge to further eliminate the inaccuracies caused by electromagnetic fields (Col. 1, lines 11-13).

8. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill III et al. in view of Dublin Jr. and further in view of Farhadiroushan et al. and Das (Pat. 4,805,449).

- With respect to claim 16, Hill III et al. fails to teach the plurality of strain gauges comprising at least one set of three fiber optic strain gauges including an axial strain gauge for measuring axial stress on the structure, a hoop strain gauge for measuring hoop stress the structure, and a temperature strain gauge for measuring temperature of the structure. Farhadiroushan et al. teaches utilizing a measurement apparatus comprising fiber optic strain gauge (See abstract). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the path determining apparatus of Hill III et al. utilizing the teachings of the drilling data apparatus of Dublin Jr. and further utilizing the teachings of the strain and temperature sensing system of Farhadiroushan et al. by providing in it a measurement apparatus comprising fiber optic strain gauge to further eliminate the inaccuracies caused by electromagnetic fields (Col. 1, lines 11-13). Das teaches a pressure measurement

apparatus that comprises hoop and axial measurement means (Col. 2-3, lines 66-23). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the path determining apparatus of Hill III et al. utilizing the teachings of the drilling data apparatus of Dublin Jr. and further utilizing the teachings of the pressure measuring apparatus of Das by providing it with means to determine hoop strain to further eliminate the bending moment effects in the obtained measurements (Col. 2-3, lines 66-23).

With respect to claim 17, Hill III et al. fails to teach at least one set of three fiber optic strain gauges is four sets spaced at ninety 90 degree intervals around the structure. Das teaches the arrangement of his strain gauges being placed at 90° intervals (Col. 2-3, lines 66-23). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the path determining apparatus of Hill III et al. utilizing the teachings of the drilling data apparatus of Dublin Jr. and further utilizing the teachings of the pressure measuring apparatus of Das by arranging the strain gauges in 90° intervals to further eliminate the bending moment effects in the obtained measurements (Col. 2-3, lines 66-23).

9. Claims 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill III et al. in view of Dublin Jr. and further in view of Kawasaki et al. (Pat. JP07043229A).

- With respect to claim 19, Hill et al. III fails to teach providing a protective ring apparatus on the structure adjacent, which is, located the plurality of strain gauges. Kawasaki et al. teaches that the utilization of a protective cylindrical or ring-like structure 22 to protect the sensing arrangement is known. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the path determining apparatus of Hill III et al. utilizing the teachings of the drilling data apparatus of Dublin Jr. and further utilizing the teachings of the load gague of Kawasaki et al. by providing it with a cylindrical ring-like structure to protect the sensing arrangement from environmental hazards that may interfere with it's functioning.
- With respect to claim 22, Hill III et al. fails to teach a cover apparatus releasably connected to the structure. Kawasaki et al. teaches that the utilization of a protective cylindrical or ring-like structure 22 that is removable and therefore releasable by means of bolts 23 to protect the sensing arrangement is known. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the path determining apparatus of Hill III et al. utilizing the teachings of the drilling data apparatus of Dublin Jr. and further utilizing the teachings of the load gague of Kawasaki et al. by providing it with a releasable cylindrical ring-like structure to protect the sensing arrangement from environmental hazards that may interfere with

it's functioning, also allowing the removal of said covering to verify the status of the arrangement.

***Allowable Subject Matter***

10. Claims 14-15, 20 and 28-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, or if the limitations in said claims are inserted in the base claim, including all of the limitations of the base claim and any intervening claims.

***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lilybett Martir whose telephone number is (571)272-2182. The examiner can normally be reached on 9:00 AM to 5:30 PM.

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571)272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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